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NTE3044
Optoisolator
NPN Darlington Transistor Output

Description:

The NTE3044 consists of a gallium arsenide infrared emitting diode optically coupled to a monolithic silicon photodarlington detector in an 6–Lead DIP type package. This device is designed for use in applications requiring high sensitivity at a low input current.

Features:

- High Sensitivity to Low Input Drive Current
- High Collector–Emitter Breakdown Voltage
- No Base Conncetion for Improved Noise Immunity

Applications:

- Appliances, Measuring Instruments
- I/O Interfaces for Computers
- Programmable Controllers
- Portable Electronics
- Interfacing and Coupling Systems of Different Potentials and Impedances
- Solid State Relays

Absolute Maximum Ratings: (T_A = +25°C unless otherwise specified)

Input LED

Reverse Voltage, V_R 3V
Continuous Forward Current, I_F 60mA
LED Power Dissipation (with Negligible Power in Output Detector, T_A = +25°C), P_D 120mW
Derate Above 25°C . . . . . 1.41mW/°C

Output Detector

Collector–Emitter Voltage, V_{CEO} 80V
Emitter–Collector Voltage, V_{ECO} 5V
Detector Power Dissipation (with Negligible Power in Output Detector, T_A = +25°C), P_D . 150mW
Derate Above 25°C . . . . . 1.76mW/°C

Total Device

Isolation Surge Voltage (Peak AC Voltage, 60Hz, 1sec Duration, Note 1), V_{ISO} 7500V
Total Device Power Dissipation (T_A = +25°C), P_D 250mW
Derate Above 25°C . . . . . 2.94mW/°C
Ambient Operating Temperature Range, T_A . . . . . –55° to +100°C
Storage Temperature Range, T_{stg} . . . . . –55° to +150°C
Lead Temperature (During Soldering, 1/16” from Case, 10sec), T_L . . . . . +260°C

Note 1. Isolation surge voltage is an internal dielectric breakdown rating. For this test, Pin1 and Pin2 are common, and Pin4, Pin5, and Pin6 are common.

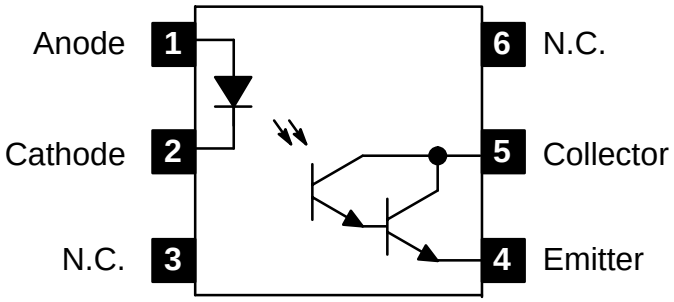
Electrical Characteristics: (T_A = +25°C unless otherwise specified)

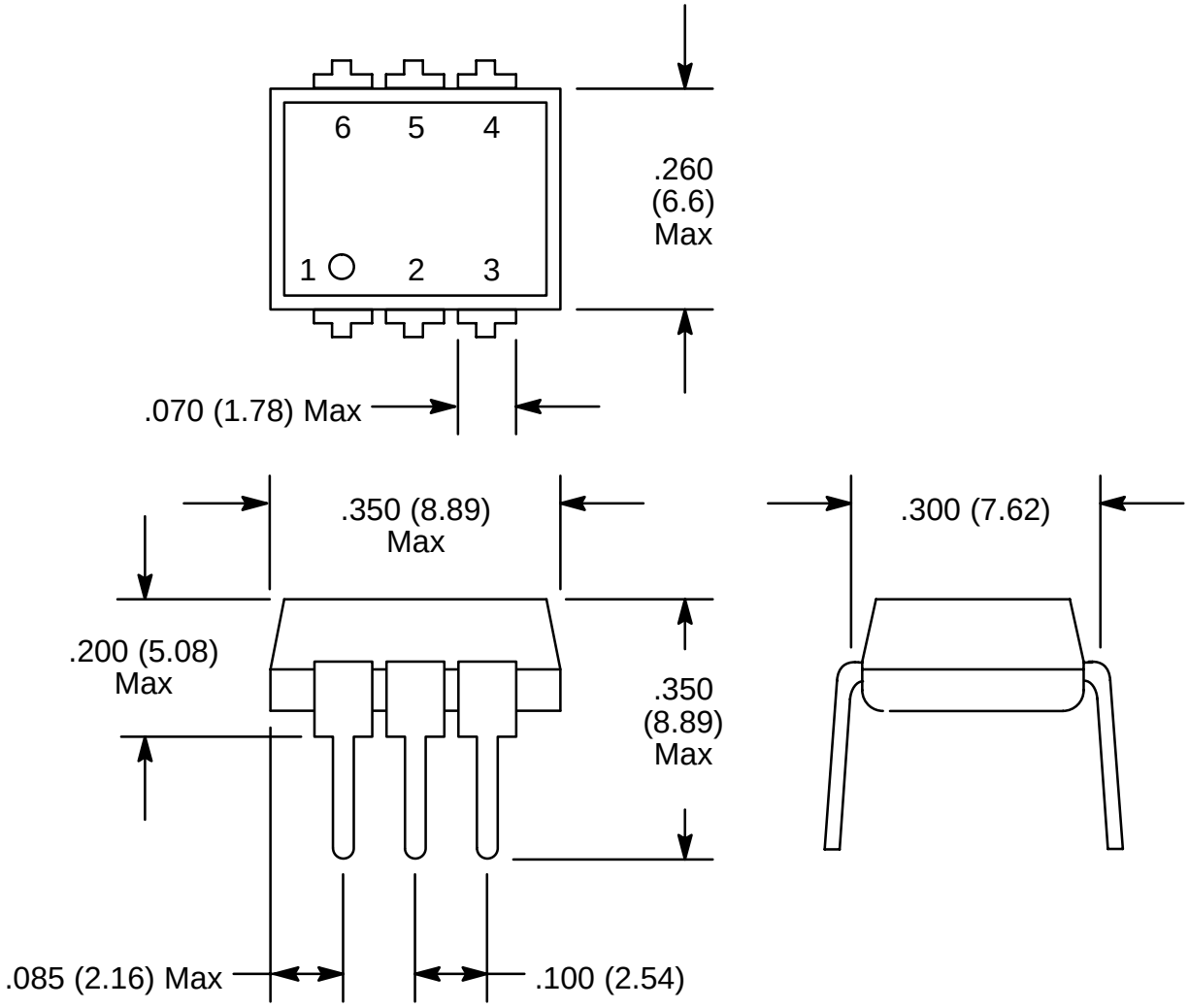
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Input LED						
Reverse Leakage Current	I_R	V_R = 3V	–	0.05	10	µA
Forward Voltage	V_F	I_F = 10mA	–	1.15	2.0	V
Capacitance	C	V_R = 0, f = 1MHz	–	18	–	pF
Photodarlington (I_F = 0)						
Collector–Emitter Dark Current	I_{CEO}	V_{CE} = 60V	–	–	1	µA
Collector–Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C = 1mA	80	–	–	V
Emitter–Collector Breakdown Voltage	$V_{(BR)ECO}$	I_E = 100µA	5	–	–	V
Coupled						
Collector Output Current	I_C	V_{CE} = 1.5V, I_F = 10mA	30	–	–	mA
Isolation Surge Voltage	V_{ISO}	60Hz Peak AC, 5sec, Note 2, Note 3	7500	–	–	V
Isolation Resistance	R_{ISO}	V = 500V, Note 2	–	10^{11}	–	Ω
Isolation Capacitance	C_{ISO}	V = 0, f = 1MHz, Note 2	–	0.2	–	pF
Switching						
Turn–On Time	t_{on}	V_{CC} = 10V, R_L = 100Ω, I_F = 5mA	–	3.5	–	µs
Turn–Off Time	t_{off}		–	95	–	µs
Rise Time	t_r		–	1	–	µs
Fall Time	t_f		–	2	–	µs

Note 2. For this test, LED Pin1 and Pin2 are common and Phototransistor Pin4 and Pin5 are common.

Note 3. Isolation Surge Voltage, V_{ISO}, is an internal device dielectric breakdown rating.

Pin Connection Diagram




6
5
4
1
2
3
.260
(6.6)
Max
.070 (1.78) Max
.350 (8.89)
Max
.300 (7.62)
.200 (5.08)
Max
.350
(8.89)
Max
.085 (2.16) Max
.100 (2.54)